Via electronic submission

November 3, 2015

Commissioner Robert Klee
Connecticut Department of Energy and
Environmental Protection (DEEP)
10 Franklin Square
New Britain, CT 06051

Re: Connecticut 2016-2018 Conservation and Load Management Plans

Commissioner Klee,

On behalf of Northeast Energy Efficiency Partnerships (NEEP)[1], please accept our comments regarding the Connecticut Energy Efficiency Fund's Conservation and Load Management Plan for 2018-2018, submitted on October 1, 2015. NEEP is a regional non-profit organization that works to accelerate energy efficiency in homes, buildings and industry across the Northeast and Mid-Atlantic states. Our Policy Outreach and Analysis group serves as an information resource for policymakers, program administrators, and others to support the adoption and implementation of public policies and programs that advance energy efficiency.

NEEP is one of six Regional Energy Efficiency Organizations (REEOs), as designated by the U.S. Department of Energy, which works in cooperation with the DOE to support states receiving U.S. Department of Energy guidance. In this context, you may notice a number of U.S. DOE State and Local Energy Efficiency Action Network (SEE Action) Resources cited in our comments. While Connecticut is a leader in many areas of energy efficiency policies and programs, there are some excellent resources available from this peer network that may help Connecticut advance its goals even further. NEEP is available to help present and interpret these resources. In addition, Connecticut is fortunate to have Bryan Garcia of the state's Green Bank serving as co-chair of the SEE Action Financing Solutions Working Group.

1. Introduction

We congratulate the Connecticut Energy Efficiency Board ("the Board"), Department of Energy and Environmental Protection ("the Department"), Eversource, United Illuminating, Connecticut Natural Gas, and Southern Connecticut Gas ("the Companies") on the timely development of the 2016-2018 Conservation and Load Management Plan ("the Plan"). We applaud the continuing commitment of all parties to the collaborative process before the Board, which a recent publication from the SEE Action Network highlights as

[1] These comments are offered by NEEP staff and do not necessarily represent the view of the NEEP Board of Directors, sponsors or partners.

an example for other states to emulate.[2]

We offer the following comments to highlight NEEP resources, DOE Guidance, and additional best practices learned from across the Northeast region that can help inform the efficiency program implementation during the 2016-18 timeframe. Our comments are outlined in approximate accordance with the Plan itself, covering:

- Residential Programs
- Commercial and Industrial Programs
- Education and Outreach
- Benefit-Cost Screening
- Demand Response and Emerging Technologies
- and Program Evaluation.

2. Residential Sector

The Plan Outlines a number of residential initiatives on which NEEP offers comment, including:

(1) Residential Retail Products;
(2) Residential New Construction;
(3) Residential HVAC and Domestic Hot Water Heating;
(4) Home Energy Solutions; and
(5) Behavior Based Program: Home Energy Reports

2.1. Residential Retail Products

Residential retail products—and specifically residential lighting offerings—are a major driver of efficiency program savings throughout the region.[3] The residential lighting market is evolving quickly due to rising baselines and the deployment of Light Emitting Diode (LED) technologies through upstream market incentive programs.

Accordingly, the Companies' proposed shift toward "incentivizing only high-efficacy standard (general service) and specialty (non-general service) LED bulbs by sometime in 2018" can be viewed as a reasonable strategy. Yet, while the eventual shift toward an LED-only market place may be in our future, evidence suggests that the residential lighting market is far from transformed, and will continue to require sustained incentives to avoid a consumer backslide toward inefficient products.[4]

NEEP applauds the Companies' observation that "Continuous monitoring of the marketplace, along with

[2] See Generally, State and Local Energy Efficiency Action Network. (2015). Energy Efficiency Collaboratives. Michael Li and Joe Bryson. Pages 11, 36. Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/EECollaboratives-0925final.pdf
[3] Accounting for up to 30% of program savings to date according to ISO-NE.
[4] Miziolek, Claire (et.al.) The State of Our Sockets: A Regional Analysis of the Residential Lighting Market. (August 2015) Available at: http://www.neep.org/sites/default/files/resources/StateOfOurSocketsFinal_0.pdf

maintaining program flexibility, will be key to the successful market transformation toward LED technologies without backsliding toward the adoption of less-efficient products."[5] As the Companies "Continuously monitor the dynamic lighting marketplace to proactively address new regulations, their implementation, and emerging technologies,"[6] NEEP directs stakeholders toward our 2014-2015 Residential Lighting Strategy Update, recent webinar, and accompanying blog assessing the state of lighting market transformation.[7] NEEP will continue to support these efforts to identify opportunities within the dynamic residential lighting market through our forthcoming 2015-16 iteration of the Residential Lighting Strategy, expected before Q1 2016.

We were also encouraged by the Companies' reference to continued monitoring and analysis of the Efficient Product Finder Pilot,[8] as well as the potential for collaboration with the Environmental Protection Agency around a pilot of their Retail Products Platform.[9] NEEP views e-commerce as an important new factor in delivering energy efficiency programs, allowing a level of customized outreach that resembles the Companies' region-leading market segmentation efforts, but at the individual customer level. To support the proliferation of best practice e-commerce strategies such as those identified within the Plan, NEEP will be publishing a white paper on the subject in the first quarter of 2016.[10]

2.2. Residential New Construction

The Residential New Construction Market provides some of the most cost-effective savings opportunities within an efficiency program administrator's portfolio, but experience has shown that an effective residential new construction efficiency program requires robust monitoring to ensure a building performs as planned.[11] Within this context, we offer comments on: (1) the potential for attributed savings from energy code compliance; (2) the potential for a "stretch" building energy code; and (3) the embrace of the Home Energy Rating System.

2.2.1. Attributed Savings for Energy Code Compliance

To ensure that the design-build process captures sufficient levels of energy savings, some program

[5] Connecticut 2016-2018 Electric and Natural Gas Conservation and Load Management Plans (October 2015) Page 256. Available at: http://www.ct.gov/deep/lib/deep/energy/conserloadmgmt/2016_2018_CLM_PLAN_FINAL.pdf

[6] *id*. at Page 263.

[7] NEEP. Northeast Residential Lighting Strategy: 2014-15 Update. (December 2014) Available at: http://www.neep.org/northeast-residential-lighting-strategy-2014-2015-update

[8] *Supra* at note 5. Page 270.

[9] *Supra* at note 5. Page 264.

[10] *See Generally*, Bresler, Samantha. Three Forces Bringing Ecommerce into the Energy Efficiency World. (October 2015) Available at: http://www.neep.org/blog/3-forces-bringing-ecommerce-energy-efficiency-world-0

[11] KEMA. Rhode Island Energy Code Compliance Baseline Study. (Stating that "on average commercial buildings perform approximately 30% worse than the code requires, and, by extension, use 30% more energy than fully compliant buildings") (July 2012) Available at: http://www.rieermc.ri.gov/documents/evaluationstudies/2012/RI%20Code%20Compliance%20Baseline%20Study%20%20Final%20Report%20-%20July%2023%202012.pdf

administrators provide trainings for building officials and other industry members seeking to embrace the latest iteration of the building energy code. For example, the Plan notes that in 2016 Companies plan to hold extensive workshops and "[W]ill explore the idea of attributing energy savings from IECC 2012 and IECC 2015 trainings for building officials, trade allies, and others to the Residential New Construction program's portfolio."[12]

NEEP supports such training, but also suggests the mobilization of third party specialists to help relieve limitations of resource-constrained local building officials tasked with enforcing the energy code, thereby shifting this responsibility to individuals trained specifically to fulfill plan review and inspection tasks. We have helped other states in the region to develop such programs, and can assist this initiative by providing case studies of states and jurisdictions in the region employing third party energy specialists. To support the efforts of these third-parties, NEEP maintains on our website a code compliance toolkit for use with the latest energy codes.[13]

We can also provide stakeholders with the relevant attribution methodologies necessary for the Companies to claim savings from their code support efforts as part of the Plan. NEEP's 2013 report on "Attributing Building Energy Code Savings to Energy Efficiency Programs" provides a framework for how energy code training, education, and enforcement programs may be attributed to a utility program administrator's energy efficiency and conservation program.[14]

The report includes an inventory of efficiency programs across the country that support energy code-related activities; assessments of the evaluation and attribution methodologies for supporting code activities; and recommended pathways for PAs to pursue in order to claim savings from code support activities.
Shortly after the publication of this report, the Rhode Island Public Utility Commission directed its program administrator, National Grid, to develop a methodology and plan for supporting both building energy code and appliance standards advancement activities in the state. That methodology and plan was approved by state regulators in 2013, and could be replicated by the State of Connecticut.[15]

2.2.2. Stretch Energy Code

We also suggest the development of voluntary stretch codes as a way of achieving additional energy savings and accelerating market preparedness for future technologies and requirements. Indeed, the Companies have stated their intention to "[R]eview NEEP's recent research efforts on 2012 and 2015 IECC adoption, including

[12] *Supra* at note 5. Page 272, 280.
[13] NEEP. Code Compliance Toolkit. Available at: http://www.neep.org/sites/default/files/resources/Compliance-Toolkit.pdf
[14] Northeast Energy Efficiency Partnerships (et.al.) Attributing Building Energy Savings to Energy Efficiency Programs. (February 2013) Available at:
http://www.neep.org/sites/default/files/resources/NEEP_IMT_IEE_Codes%20Attribution%20FINAL%20Report%2002_16_2013.pdf
[15] Narragansett Electric Co. 2013 Energy Efficiency Program Plan for Settlement of the Parties. (Docket No. 4366) Attachment 2, Pages 21-26. Actual pages 168-173. Available at: http://www.ripuc.org/eventsactions/docket/4366-NGrid-2013EEPP(11-2-12).pdf

the work of Massachusetts, Rhode Island, Vermont, and Washington D.C. to develop and adopt a 'stretch' energy code."[16] The latest update to NEEP's Model Stretch Code is planned for publication before the first quarter of 2016. We have previously assisted both Massachusetts and Vermont in the adoption of a stretch code. We also offer our Code Adoption Toolkit to aid the Companies in their stretch code adoption efforts.[17]

2.2.3. Embrace of the DOE Home Energy Score

The Plan states that "In 2016, the Residential New Construction program's Prescriptive Path will be eliminated and the Companies will launch a performance-based design tier incentive system using the HERS Index. The HERS Index will serve as the core structure for the 2016-2018 Residential New Construction program for single-family and low-rise multi-family projects."[18] NEEP supports this move toward a HERS-only pathway, due to the low utilization of the prescriptive pathway, but would also suggest emphasis on application of the Department of Energy's Home Energy Score whenever possible.

Indeed, the Companies suggest they will "[E]xplore coordinating efforts with DEEP to provide education and outreach to the real estate, home inspection, and appraisal communities in order to educate these sectors about energy ratings and labeling systems, such as HERS and the DOE HEScore, in order to further transform the new construction and real estate markets."[19] We note that the State of Connecticut is a key partner with NEEP on a recent grant to develop a Home Energy Labeling Information Exchange (HELIX) that transmits Home Energy Score data from efficiency program administrators to Real Estate Multiple Listing Services (MLS).[20] We plan to support the proposed educational efforts through the rollout of the HELIX project, and believe that bringing home performance to the forefront of a purchasing decision will create a market mechanism to drive energy efficient new construction.

2.3. Residential HVAC and Domestic Hot Water Heating

The plan conveys support for ductless heat pumps, and cites participation in NEEP's Northeast and Mid-Atlantic Air-Source Heat Pump Working Group during development of the Group's Cold Climate Air-Source Heat Pump (cc-ASHP) specification. The Companies note that "[T]he new ccASHP specifications will help the Companies monitor the energy performance of air source heat pumps and to shift incentive levels for units based on efficacy."[21] They further explain that "the ccASHP specifications did not denote a specific SEER rating, [so] the companies have selected a SEER rating for single indoor unites and an 18 SEER rating for multi-outdoor units."[22]

[16] *Supra* at note 5. Page 280.
[17] NEEP. Code Adoption ToolKit. Available at: http://www.neep.org/sites/default/files/resources/Adoption-Toolkit.pdf
[18] *Supra* at note 5. Page 274.
[19] *Supra* at note 5. Page 279.
[20] US Department of Energy. Office of Energy Efficiency and Renewable Energy. State Energy Program 2015 Competitive Award Elections http://energy.gov/eere/wipo/state-energy-program-2015-competitive-award-selections
[21] *Supra* at note 5. Page 285.
[22] *Supra* at note 5. Page 285.

We support the Companies' embrace of ccASHP technologies. We have facilitated a regional initiative around the development of the air source heat pump (ASHP) market since 2013. We agree that this technology offers some unique opportunities to both save net energy and greenhouses gases, while also noting that managing its impact on the grid is vital to its promotion by states and programs. We invite the Companies and the Department to stay engaged with our regional Initiative to address key market barriers/opportunities at a regional level. Some of the areas of priority in 2016 may include discussions around grid level impacts of a broad deployment of ASHPs, the next generation of ASHP control systems, system selection/sizing guidance, installation best practices, and examination of emerging business models.

Ultimately, the specification aims for regional consistency and uniformity across program requirements for efficient cold-climate heat pumps. As is demonstrated in our incentive chart, there are currently a wide range of program offerings and requirements for the technology.[23] We encourage the Companies to align their SEER specifications with that of neighboring program administrators, so that stakeholders can avoid industry confusion and leverage the cumulative power of the region to lower energy, cost, and carbon for their customers.

2.4. Home Energy Solutions Program

We congratulate the Companies on the continued success of their flagship Home Energy Solutions program. As Connecticut moves through iterations of its residential program delivery model, and is seeking to grow savings among program participants in the Home Energy Solutions program, we offer as support a relevant SEE Action Resource entitled *A Policymaker's Guide to Scaling Home Energy Upgrades*.[24] This guide explores issues related to financing, home energy labeling, energy data access, and cost-effectiveness.

Aside from the above recommendation, we offer comment on three components of the program: (1) Embrace of Home Energy Score; (2) Multifamily Segmentation; and (3) Program Funding.

2.4.1. Embrace of Home Energy Score

The Plan states that ""Connecticut will be able to create statewide policies that require the integration of the DOE HEScore into real estate listings."[25] For the reasons discussed above in Section 2.2.3, *Embrace of the DOE Home Energy Score*, we support the Companies' embrace of Home Energy Score within the Home Energy Solutions Program. Reaching beyond the new construction market will provide greater transparency between

[23] NEEP. Cold Climate Air Source Heat Pump Incentive Summary. Available at: http://www.neep.org/sites/default/files/resources/Regional_Air-Source_Heat_Pump_Incentive_Snapshot.pdf
[24] State and Local Energy Efficiency Action Network. A Policymaker's Guide to Scaling Home Energy Upgrades. (2015) Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/Residential%20Policymakers%20Guide_093015_v2.pdf
[25] *Supra* at note 5. Page 297.

home buyers and sellers, creating a market mechanism to accelerate energy efficient retrofits.
We applaud the Companies for their commitment to "[W]ork in partnership with DEEP to further educate and engage the real estate community about the value of energy efficiency, and of utilizing and leveraging the DOE HEScore."[26] In support of these educational efforts, we offer a recent NEEP Publication providing *Guidance for Real Estate Professionals on Home Energy Efficient Attributes*.[27]

2.4.2. Multi-Family Markets

The Plan states that the Companies "[W]ill continue to leverage partnerships to provide streamlined market solutions and financing to reduce energy costs for property owners and tenants utiliz[ing] key industry partners to continue addressing residential properties in the most comprehensive manner."[28]
We support the Companies' emphasis on partnerships, and suggest they coordinate their efforts with a number of regional and national multifamily professional groups including NEWHAB, Efficiency for All, and the Energy Foundation.[29] We are active participants in these networks and believe they can provide great value in terms of knowledge sharing. We also suggest they consider collaborating with the Public Purpose Energy Services Company (PPESCO) Commons Energy for options related to turn-key large multifamily retrofit solutions.[30] For further perspectives on multi-family efforts within the region, we suggest review of NEEP's topical paper, *Increasing Energy Efficiency in Small Multi-family Properties in the Northeast*.[31] The paper contains extensive baseline data on small multi-family properties in Connecticut and throughout the Northeast, a discussion of relevant barriers to improved efficiency, a discussion public policies that might overcome market barriers, and several case studies.

Additionally, the Plan predicts a need to analyze if "certain segments of customers, such as those who have been identified as customers whose income levels fall within a certain percent of the state's median income, are being adequately served by the HES program," or require uniquely tailored approaches to both capture cost-effective energy savings and achieve equity goals.[32]

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[26] *Supra* at note 5. Page 295.
[27] NEEP. Guidance for Real Estate Professionals on Home Energy Efficient Attributes. Available at: http://www.neep.org/sites/default/files/resources/Guidance%20for%20Real%20Estate%20Professionals%20on%20Home%20Energy%20Efficient%20Attributes.pdf
[28] *Supra* at note 5. Page 301.
[29] The Network for Water, Energy, and Health in Affordable Buildings (NEWHAB). Available at: http://energyefficiencyforall.org/newhab
[30] Commons Energy is a Public Purpose Energy Services Company (PPESCO) dedicated to serving traditionally under-served markets, such as multi-family, low income, and municipal customers with turnkey retrofit solutions. For more information, see http://www.commonsenergy.com/
[31] NEEP. Increasing Energy Efficiency in Small Multi-Family Properties in the Northeast. Available at: http://www.neep.org/increasing-energy-efficiency-small-multifamily-properties-northeast
[32] *Supra* at note 5. Page 296.

This prediction presents an opportunity for shared learning from similar programs in Massachusetts, which designed two offerings within their most recent 2016-2018 Energy Efficiency Plan that Connecticut might emulate in the future. The first is exclusive to the Moderate Income market segment—between 61 and 80 percent of median income—and will cover 90 percent of weatherization costs up to $3,000, with the possibility of incorporating other technologies.[33] The second is a renter-specific visit within the program, which offers instant savings measures at no cost to the renter, while utilizing the visit to identify energy savings opportunities for the landlord to respond to.[34]

2.4.3. Program Funding

Efficiency program administrators from around the country have been looking at Connecticut's experiments in developing financing tools through the Green Bank, in both the residential and commercial sectors. We are glad to see the ongoing collaboration and coordination between CEFIA and the Companies, as financing, ratepayer dollars and customer investments make up the three legs of the stool of successful project implementation.

Though, in discussing the Home Energy Score Program, the plan notes that "The Companies will endeavor to use every means to effectively manage the budgets, but may ultimately be faced with program curtailment if the funding is exhausted."[35] This contrasts with a request for "revenues to fund [District heating] incentive payments through a fully reconciling conservation adjustment mechanism ("CAM")…in addition to revenues for the programs pursuant to section 16-245m of the Connecticut General Statutes.[36]

While we support District Heating, we encourage the Companies and the Department to work with the legislature to examine funding mechanisms that might be used to capture all cost-effective energy efficiency investments. Energy efficiency has consistently proven itself as the least-cost energy resource,[37] and—as the Department recognizes—consistently provides non-energy benefits beyond simple economic returns.

2.5. Behavior-Based Programs: Home Energy Reports

The Plan's section on Home Energy Reports states that "Eversource will explore a targeted expansion utilizing a market segmentation approach to enhance program delivery." To support potential targeted expansion of the Home Energy Reports program, we suggest review of the DOE's recent series of SEE Action publications covering

[33] Massachusetts 2016-2018 Energy Efficiency Program Plan. (October 2015) Page 63. Available at: http://ma-eeac.org/wordpress/wp-content/uploads/Exhibit-1-Gas-and-Electric-PAs-Plan-2016-2018-with-App-except-App-U.pdf
[34] *id*. at Page 44.
[35] *Supra* at note 5. Page 293.
[36] *Supra* at note 5. Page 400.
[37] Lazard. 2014 Levelized Cost of Energy Analysis. Available at: http://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf

the persistence of savings,[38] peak coincidence,[39] and targeting opportunities for Home Energy Reports.[40] Amongst other conclusions, the SEE Action analysis found that households with an air conditioner are much more likely to adjust their consumption habits as a results of a home energy report than a household without air conditioning.[41] This conclusion could provide some insights into potential markets to target. For a summary of the reports, we suggest reviewing a recent NEEP blog on the subject matter.[42]

3. Commercial and Industrial

Connecticut's approach to market segmentation and tailored marketing of programs are also nation-leading. Understanding end-uses and the users themselves will help the Companies wring more electric and gas savings out of the programs, and lead to more satisfied customers. We applaud the array of programs in the Plan — Whole Building, Performance-Based Procurement, and a range of technical and integrated support options mean there is something for every business customer, regardless of size or mission. The Plan outlines a number of specific commercial and industrial segments and approaches on which NEEP offers comment, including:

(1) The Commercial Real Estate Market
(2) The Government Facilities Market
(3) The Healthcare Market
(4) Energy Conscious Blueprint Solutions
(5) Energy Opportunities Solutions; and
(6) Business and Sustainability Solutions

3.1. The Commercial Real Estate Market

The Plan notes that "The Companies are considering the potential use of the *Advanced Buildings* program, developed by the New Buildings Institute."[43] NEEP works closely with the New Buildings institute and, incorporates Advanced Buildings program into the Northeast Collaborative for High Performance Schools (NE-CHPS) Criteria for school construction and major renovation. NEEP supports use of the *Advanced Buildings* program, and encourages its use as a pathway toward zero net energy within the Commercial Real Estate Market.

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[38] State and Local Energy Efficiency Action Network. Insights from Smart Meters: Ramp-Up, Dependability, and Short-Term Persistence of Savings from Home Energy Reports (2015) Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/smartmeters_rampup.pdf

[39] State and Local Energy Efficiency Action Network. Insights from Smart Meters: The Potential for Peak-Hour Savings from Behavior-Based Programs (2014). Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/smart_meters.pdf

[40] State and Local Energy Efficiency Action Network. Insights from Smart Meters: Identifying Specific Actions, Behaviors, and Characteristics That Drive Savings in Behavior-Based Programs. (2014). Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/insights_from_smart_meters_behavior_based_final.pdf

[41] *id.*

[42] NEEP. Caric, Kathryn. As Advanced Metering Grows, SEE Action Describes Potential for New Energy Savings. Available at: http://neep.org/blog/advanced-metering-grows-see-action-describes-potential-new-energ

[43] *Supra* at note 5. Page 354.

3.2. The Government Facilities Market

We strongly support the Companies' focus on the governmental facilities market. As the Plan notes, "Educational and Governmental Agency Customers represent approximately 1/3 of all commercial electric customers."[44] This presents a significant opportunity for energy savings that can be achieved through top-down leadership, coupled with the willing embrace of energy performance contracting. Furthermore, the government sector has access economies of scale that can help build and transform markets in a manner seldom seen in the private sector.

As Connecticut's municipal facilities reach toward their goal of 20 percent energy savings by 2018,[45] we remind program managers and municipal energy managers of the opportunity to participate in NEEP's Public Buildings Leadership Group, which identifies government facility operation and maintenance best practices throughout the region for dissemination to stakeholders.[46] We also direct stakeholders toward NEEP's Regional Operations and Maintenance Guide for Schools and Public Buildings in the Northeast and Mid-Atlantic, which contains a plethora of best practice strategies for public building operation and maintenance[47]

We also encourage Connecticut's adoption of the NE-CHPS School construction and major renovation standard mentioned above.[48] Schools present a unique opportunity for the public sector to lead by example due to their occupancy profile and longed lifecycle; characteristics that position them well as pilots projects for zero net energy construction. The latest version of NE-CHPS offers a path toward zero net energy construction based on the zero energy policy indicator score, but also through the New Buildings Institute's Advanced Buildings Guide. NEEP holds the license to NE-CHPS on behalf of regional stakeholders, and updates the criteria consistently to keep pace with changes in energy codes and building technology. Currently the Commonwealth of Massachusetts and the State of Rhode Island offer incentives for designers who construct according to the NE-CHPS criteria.

3.3. The Healthcare Market

Hospitals are a major consumer of energy in Connecticut, representing "[A]pproximately ten percent of the

[44] *Supra* at note 5. Page 344.
[45] Conn. Public Act No. 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future. Available at: https://www.cga.ct.gov/2011/act/pa/2011PA-00080-R00SB-01243-PA.htm
[46] See Generally, NEEP Public Buildings Leadership Group Meeting Agenda. (November 2014) Available at: http://www.neep.org/sites/default/files/Final%20Agenda%20November%2012%20Public%20Buildings%20Meeting.pdf
[47] NEEP. Regional Operations and Maintenance Guide for Schools and Public Buildings in the Northeast and Mid-Atlantic (August 2013) Available at: http://www.neep.org/sites/default/files/resources/O%26M%20Guide%20Revision%20v2.5_FINAL.pdf
[48] Northeast Collaborative for High Performance School New Construction and Major Renovation Criteria. (October 2015) Available at: http://www.neep.org/sites/default/files/resources/NE%20CHPS%203.1%20Criteria%20Update_10-19-15.pdf

[Company's] commercial sector sales."[49] Understanding this reality, in 2014, NEEP highlighted energy efficiency improvements at the Connecticut Children's Medical Center, which was chosen as a State Champion through our Business Leaders Program.[50] As part of NEEP's 2016 Business Leaders Campaign NEEP is highlighting the energy savings opportunities recently embraced at Concord Hospital, a 230-bed facility in New Hampshire.[51] We offer these case studies to support program administrator efforts to serve this vital market segment and help draw other healthcare providers toward energy savings and occupancy comfort opportunities.

3.4. Energy Conscious Blueprint Solutions

The Plan states that the Companies are "Exploring performance-based procurement for new construction… [where] building owners establish and specify [a legally enforceable] energy performance requirement as part of the design and contractor team selection process."[52] NEEP supports the performance-based procurement strategy contemplated in the energy conscious blueprint program because it provides a market-based mechanism to secure high performance design and construction.[53]

3.4.1. Energy Opportunities Solutions

The Plan notes that the Companies have "[B]egun to investigate the opportunity to develop initial building specific audits remotely, using providers of various 'remote audit' tools and services for certain large, managed office and professional buildings, such as corporate headquarters, hospitals, and colleges and universities. It is expected that such remote audits, without requiring the investment of human and time resources in a physical, on-site audit, can serve to "triage" such buildings to identify specific buildings and systems ripe for further investigation and EO project development."

We are encouraged by the Companies' pursuit of technologies and analytical capabilities that can limit administrative overhead associated with investing in energy improvements. To support their efforts, we direct them to similar efforts within the region, and suggest that they review findings from Phase 1 of the Massachusetts Building Asset Rating Pilot.[54] The pilot sought to minimize on-site assessment time for audits, with an initial analysis concluding that remote audit data can lower audit costs, but that site visits hold a valid purpose for assessing the validity of remote audit data. A forthcoming report on Phase Two of the pilot is due for publication in in the fourth quarter of 2015.

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[49] *Supra* at note 5. Page 361.
[50] NEEP. 2014 Business Leaders Case Study. Connecticut Children's Medical Center. Available at: http://www.neep.org/case-study/connecticut-childrens-medical-center
[51] NEEP. 2016 Business Leaders Case Study. Concord Hospital. Available at: http://neep.org/case-study/concord-hospital
[52] Connecticut 2016-2018 Electric and Natural Gas Conservation and Load Management Plans (October 2015) Page 361. Available at: http://www.ct.gov/deep/lib/deep/energy/conserloadmgmt/2016_2018_CLM_PLAN_FINAL.pdf
[53] *Supra* at note 5. Page 399.
[54] NEEP. Building Asset Rating. Available at: http://www.neep.org/initiatives/energy-efficient-buildings/building-asset-rating

Additionally, NEEP's Regional EM&V Forum ('the Forum') is currently conducting research to better understand experience to date with software as a service (SaaS) tools that support remote auditing, and in some cases also automated measurement and verification (M&V), with a focus on opportunities, challenges and regulatory considerations for use of such tools to help streamline and enhance current practice. For more information on this, we suggest review of our recent webinar on the "Changing EM&V Paradigm".[55]

3.4.2. Business and Energy Sustainability Solutions

The Plan notes that "The Business Sustainability Challenge ("BSC") addresses energy efficiency in the context of sustainability and competitive business advantages making Strategic Energy Management ("SEM") accessible, achievable, and profitable.[56] NEEP applauds the collaborative efforts of the Companies to better address the needs of commercial and industrial customers in the 2016-18 Plan. It is clear that customer experiences and input have been heard, and Connecticut is taking some nation-leading approaches with things like customer segmentation, understanding and addressing the barriers for manufacturers to participate in programs, putting Strategic Energy Management (SEM) to work and eliminating the $2 million incentive cap for the largest accounts when Customized Solutions Partnerships (CSPs) or Memorandums of Understanding (MOUs) are in place. These innovations should help the Companies harness very cost-effective efficiency while empowering the largest users to make long-term investments to continuously drive down energy intensity of their facilities.

Incorporating lessons learned in-state and from other leaders and sharing information between the Companies is critically important to improve marketing and program delivery. Building relationships and trust, having account managers with technical expertise and knowledge of plant conditions as well as financial calendars, and allowing flexibility and support are and will be key to the success of these programs. NEEP will continue to follow the implementation of the CSPs and MOUs and SEM as program best practices and alternatives to largest customers seeking to self-administer energy efficiency programs. Experience in other states has shown that so called opt-out programs leave valuable savings on the table, undermining state and utility savings goals, and harming all customers who end up paying more for their energy.

To further support the Companies in their Business and Energy Sustainability Solutions initiative, we direct them toward a related See Action resource, *Sustained Energy Savings Achieved through Industrial Customer Interaction with Ratepayer Programs: Case Studies*.[57] The resource centers upon four industrial customer case studies, including: a blood component and cellular technologies company; a bio-refiner and manufacturer of

[55] NEEP. Changing EM&V Paradigm- Landscape of New Tools & Data Analytics. (July 2015) Available at: http://www.neep.org/sites/default/files/resources/NEEP%20DNVGL%20EMV%2007292015%20Final_4.pdf

[56] *Supra* at note 5. Page 405.

[57] State and Local Energy Efficiency Action Network. Sustained Energy Savings Achieved through Successful Industrial Customer Interaction with Ratepayer Programs: Case Studies (October 2015). Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/IEE%20Case%20Studies_1002.pdf

industrial organic chemicals; an injection molding manufacturer; and an aluminum rolling mill. It provides recommendations for customers and program administrators to make the most program incentives.

4. Education and Outreach

Within the Context of the Clean Energy Communities program, the Plan notes that "In 2016-2018, the Companies will expand the Clean Energy Communities program to create resilient, sustainable communities," and that "[I]n 2016, Clean Energy Communities will focus its programmatic delivery through the newly established Sustainable-Energy Community Strategy."[58] The Clean Energy Communities program could be used to draw municipal support for adoption of a 'stretch' energy code mentioned above; or commitments that require similar municipal support, such as participating in a Department of Energy Better Buildings Accelerator or completing an LED Street Lighting conversion.[59] Such commitments usually bring energy efficiency to a place of high visibility with a community.

5. Customer Engagement Platform

NEEP wholeheartedly applauds the full implementation of a multi-sector customer engagement platform across the Companies' service areas, making Connecticut a leader in the region for access to energy data and services. We firmly believe that providing customers with a simple and streamlined portal to access their energy usage data and potential energy services will open up a world of new savings opportunities for consumers and program administrators. We appreciate the Companies' support for the industry-led and DOE-supported Green Button protocol, with each of the Companies' Customer Engagement Platforms "[A]llowing customers to utilize the DOE's Green Button to download their electric usage data."[60] We also suggest that the Companies' consider building upon this success to offer Green Button's "Connect My Data" functionality, which allows a customer to transfer their energy usage information to third parties for analysis.

6. Benefit Cost Screening

The Plan states that, unlike previous years, fossil fuel emissions benefits will now be included in the Total Resource Cost Test; that the seven year DRIPE duration cap has been removed; and that "The Companies will work collaboratively with the Energy Efficiency Board and DEEP to identify and quantify additional non-energy benefits that can be used in Total Resource Cost Testing going forward."[61] To support the Department's effort to quantify these benefits, we outline below how other states in the region have approached the issue.

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[58] *Supra* at note 5. Page 419.

[59] See Generally, NEEP. LED Street Lighting Assessment and Strategies for the Northeast and Mid-Atlantic. (January 2015) Available at: http://www.neep.org/sites/default/files/resources/DOE_LED%20Street%20Lighting%20Assessment%20and%20Strategies%20for%20the%20Northeast%20and%20Mid-Atlantic_1-27-15.pdf

[60] *Supra* at note 5. Page 449.

[61] *Supra* at note 5. Page 462.

As noted by Maryland regulators earlier this year in their decision on efficiency program cost-effectiveness, omitting the value of these hard-to quantify benefits "may be the most significant problem with energy efficiency program screening methods in the United States today."[62] Indeed, non-energy impacts such as reduced arrearages, buffers against energy price increase, economic development, O&M cost, employee productivity, occupant comfort, and health and safety are real impacts that are experienced as a result of energy efficiency portfolios.

The above-mentioned non-energy impacts can be quantified in a number of ways, including: assignment of monetary values; use of proxies; use of alternative screening benchmarks; through regulatory judgment; or through a multi-attribute decision analysis (MADA). For further explanation of these quantification methods, we suggest review of the Regional Evaluation, Measurement, and Verification Forum's *Cost Effectiveness Screening Principles and Guidelines*.[63]

The chart below represents an overview of how states within the region assign value to non-energy impacts, with direct quantification, cost adders, and alternative screening benchmarks being amongst the most popular tools. The chart below represents the per-dollar household values assigned to non-energy impacts in three states which recently considered such metrics.

Table 3.3: Whether and How States Account for NEIs

Primary Test	UCT	Total Resource Cost Test					Societal Cost Test	
State	*CT*	*MA*	*RI*	*NY*	*NH*	*DE*	*VT*	*DC*
Utility-Perspective NEIs		Quantified	Quantified				15% Adder	
Low-Income / Economic Development	Alt. Benchmark	Quantified	Quantified	Alt. Benchmark	Alt. Benchmark		30% Adder	10% Adder
Improved Operations		Quantified	Quantified	Alt. Benchmark			O&M Quantified	O&M Quantified
Comfort		Quantified	Quantified				15% Adder	10% Adder
Health & Safety		Quantified	Quantified				15% Adder	10% Adder
Home Improvements		Quantified	Quantified				15% Adder	10% Adder
Participant's Utility Savings		Quantified	Quantified				15% Adder	10% Adder
Education and Contributions							15% Adder	10% Adder
Other Participant-Perspective							15% Adder	10% Adder
Societal-Perspective NEIs			Quantified				15% Adder	10% Adder

A blank cell indicates that the state does not account for this type of NEI. Source Synapse 2013.

[62] Maryland Public Service Commission. Order NO. 87082. (July 2015) Page 13. Available at: http://webapp.psc.state.md.us/Intranet/Casenum/NewIndex3_VOpenFile.cfm?ServerFilePath=C:\Casenum\9100-9199\9153\\625.pdf; Citing, Woolf, T., Steinhurst, W., Malone, E., & Takahashi, K., Energy Efficiency Cost-Effectiveness Screening, Synapse Energy Economics, Inc., for the Regulatory Assistance Project (RAP), Inc., (Nov. 2012) at 5-6, available at http://www.raponline.org/document/download/id/6149)

[63] NEEP. Regional Evaluation, Measurement, and Verification Forum. Cost Effectiveness Screening Principles and Guidelines for Alignment with Policy Goals, Non-Energy Impacts, Discount Rates, and Environmental Compliance Costs. November 2014. Page 40. Available at: http://www.neep.org/sites/default/files/resources/Forum_C-E_Screening_Guidelines_Final_No_2014.pdf

Table B.3: NEI Values in Massachusetts & Rhode Island, and Maryland (proposed) ($ per household)

Perspective / NEI Category	Maryland (SERA 2014) Dollar Range	Maryland (SERA 2014) Typical Value	Massachusetts Dollar Range	Rhode Island Dollar Range	Average Across All NEIs
Utility-Perspective					
Financial and Accounting	$2.55 - $25.00	$9.70	$2.61 - $39.90	$2.61 - $3.74	$13
Customer Service	$0.10 - $8.50	$3.25	$0.34 - $8.43	$0.34 - $8.43	$4
Other Utility Impacts	$0.13 - $2.60	$1.40	na - na	na - na	$1
Participant-Perspective					
Participant's Utility Savings	$0.27 - $36.70	$3.60	na - na	na - na	$18
Low-Income / Economic Development	$0 - $115	$75	na - na	na - na	$58
Improved Operations	$26 - $127	$82	$0.96 - $124	$0.96 - $102.40	$64
Comfort	$26 - $105	$69	$31 - $125	$1.42 - $125	$69
Health & Safety	$3.02 - $100.50	$16.50	$4 - $45	$0.13 - $45	$33
Education and Contributions	$26.25 - $177.00	$89.75	na - na	na - na	$102
Home Improvements	$10.50 - $77	$36	$17* - $1,998*	$0.32* - $678.52*	$464
Other Participant-Perspective	$0 - $4	$0	na - na	-$0.015 per kWh saved	$2
Societal-Perspective					
Economic Development	$8 - $340	$115	na - na	$0.39 per kWh saved*	$116
Environmental / Emissions	$3 - $180	$60	na - na	na - na	$92
Health Care / Health & Safety	$0 - $0.30	$0	na - na	$0 $172.53*	$58
Tax Impacts	na - na	na	na - na	na - na	n/a
National Security	na - na	na	na - na	$1.83 per MMBtu oil saved	n/a
Other Societal-Perspective NEIs	na - na	na	na - na	na - na	n/a

**Indicates a one-time benefit, not an annual benefit that accrues for the duration of a measure's lifetime.*

Dollar values are per house hold per year.

The Massachusetts values are based on the 2013 Technical Reference Manuals. The Rhode Island values are based on the 2014 Technical Reference Manual.

7. Demand Response and Emerging Technologies/Strategies

NEEP is encouraged by the Companies' willingness to pilot emerging technologies and demand response strategies. Energy usage peaks are among the most expensive usage hours on our electric grid and hold the potential for large savings. For example, in neighboring New York, the Department of Public Service estimates that if their 100 hours of greatest peak were flattened, long term avoided capacity and energy savings would range between $1.2 billion and $1.7 billion.[64] Indeed, some view the recent proliferation of demand response technologies that can also provide energy efficiency savings as a revolution in the energy industry, allowing for the balancing of expensive peak loads.[65]

7.1. Demand Response and Geo-Targeting

Within the Plan's discussion of demand response tools, the Companies note that they "[W]ill further consider geo-targeting areas across Connecticut that have been identified by ISO New England and other energy stakeholders as critical peak demand reduction areas." To support the Companies' efforts to assess demand response-related geo-targeting opportunities, we suggest review of NEEP's recently published report on the topic of Geo-targeting.[66] The report focuses on energy efficiency as a geo-targeting resource, but also discusses instances such as Con Edison's Brooklyn Queens Demand Side Management Project where demand response is used for geo-targeting constrained areas of the distribution grid. While we acknowledge that questions remain over the cost-effectiveness of demand response strategies beyond the pilot stage, the Companies' strategy toward targeting critical peak demand reduction areas—where locational marginal price is highest—is both innovative and cost-effective.

7.2. Demand Response and Emerging Technologies

The Plan describes the potential for load balancing associated with "[A]dvanced thermostatic controls for HVAC systems, which may combine with other devices to form a company-wide smart device control system or smart energy management system."[67] Three such devices mentioned in the plan that NEEP is currently focusing on include home energy management systems, advanced lighting controls, and advanced rooftop HVAC units.

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[64] New York State Department of Public Service. Case 14-M-0101. Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision. Page 20. Available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b0B599D87-445B-4197-9815-24C27623A6A0%7d

[65] See Generally, NEEP. Going Deeper: Why Program Administrators Should Care that Demand Response is Before the Supreme Court. (October 2015) Available at: http://www.neep.org/blog/going-deeper-why-program-administrators-should-care-demand-response-supreme-court

[66] NEEP. Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments. (January 2015) Available at: http://www.neep.org/energy-efficiency-transmission-and-distribution-resource-using-geotargeting

[67] *Supra* at note 5. Page 483.

7.2.1. Home Energy Management Systems

NEEP has convened a Home Energy Management Systems (HEMS) HEMS Working Group since 2014, and intends to continue to engage with HEMS stakeholders through the HEMS Working Group into 2016. We invite participation from efficiency program administrators who find such work of value. To further support the Companies efforts to understand these technologies, we suggest review of our working group publication, *Establishing Common Understanding for Home Energy Management Systems (HEMS) in Efficiency Programs"*[68] and the follow up *Opportunities for Home Energy Management Systems (HEMS) in Advancing Residential Energy Efficiency Programs*.[69] We also publish a spreadsheet[70] of various HEMS systems and components on the report's home page.

7.2.2. Advanced Lighting Controls

NEEP's Commercial Advanced Lighting Controls Project holds the potential to help drive the next generation of energy savings for program administrators as rising baselines drive innovation toward greater savings. The project will produce ten demonstration projects and associated case studies, develop scalable training programs for designers and installers, and develop replicable and scalable efficiency program offerings for advanced controls.[71]

7.2.3. Advanced Rooftop Units

Next generation, highly efficient RTU technologies exist on the market today and promise to save up to 50 percent of energy consumption compared to the standard unit. These Advanced Roof-top Units[72] (ARTUs) can also dramatically reduce electric demand during peak hours, however their uptake has been slow due to a number of stubborn market barriers. A pending NEEP report on the ARTU opportunities, barriers, and opportunities to overcome those barriers is due out in the first quarter of 2016.

8. Evaluation

The Plan notes that, in addition to evaluations conducted through the Energy Efficiency Board, the Companies participate in NEEP's EM&V Forum to take part in regional evaluations.[73] NEEP's EM&V Forum is a collaboratively

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[68] NEEP. Establishing Common Understanding for Home Energy Management Systems (HEMS) in Efficiency Programs. Available at: http://www.neep.org/sites/default/files/resources/HEMSCommonUnderstandingFinal7-29.pdf

[69] NEEP. Opportunities for Home Energy Management Systems (HEMS) in Advancing Residential Energy Efficiency Programs. (August 2015) Available at: http://www.neep.org/sites/default/files/resources/2015%20HEMS%20Research%20Report.pdf

[70] HEMS Technology Assessment. Available at: https://docs.google.com/spreadsheets/d/1FljvObFjgme0QmgizUbX0y1oz3tWGhzhlF_YsZYvzbk/edit?usp=sharing

[71] 2015 BTO Peer Review. Commercial Advanced Lighting Controls Demonstration and Deployment. Available at: http://energy.gov/sites/prod/files/2015/05/f22/cbi55_Arnold_041415.pdf

[72] NEEP. Advanced Roof Top Units. Available at: http://www.neep.org/initiatives/high-efficiency-products/advanced-rooftop-units-artu

[73] *Supra* at note 5. Page 498.

driven body working to develop and support the use of consistent savings assumptions and standardized, transparent guidelines and tools to evaluate, measure, verify, and report the energy and demand savings, costs, and avoided emission impacts of energy efficiency.[74] It represents nine jurisdictions within the Northeast and Mid-Atlantic, and is steered by a committee of state public utility commissioners, energy office, and air agency representatives.[75] We encourage the Companies to continue participating in the Forum, and offer the support of our recently completed Standardized EM&V Methods Reporting Forms[76] for uniformity of reporting within the region.

9. Conclusion

NEEP commends the Department, Staff, the Board, and the Companies for their continuing support of energy efficiency in Connecticut. It is our belief that continued coordination between the Department, Staff, the Board, and the Companies can help grow the economic engine that is energy efficiency and provide savings for ratepayers for decades to come.

Please accept these comments in the spirit they are intended: to aid the Department, Staff, the Board, the Companies, and, ultimately, the people of Connecticut, in securing a more affordable, reliable, cleaner and sustainable energy future.

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[74] NEEP. Evaluation, Measurement, and Verification (EM&V) Forum. Available at: http://www.neep.org/initiatives/emv-forum
[75] EM&V Forum Leadership and Funders. Available at: http://www.neep.org/emv-forum-leadership
[76] EM&V Forum. Standardized EM&V Methods Reporting Forms. Available at: Standardized EM&V Methods Reporting